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By Professor N. E. Hansen

Department of Horticulture, State College, Brookings, South Dakota

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U. S. Department of Agriculture

This department does not conduct a commercial nursery, but propagates and distributes new varieties originated in this department or imported from similar climates of the Old World. In the work of originating new fruits more than 600,000 seedlings have been grown the past 35 years. The improvement in size and quality each plant generation is greater year by year. Hybridization and selection are the main methods of improvement. The varieties distributed so far are described in Bulletin 224. The work with hardy roses is described in Bulletin 240. Bulletin 246: The Shade, Windbreak and Timber Trees of South Dakota. Bulletin 254: Evergreens in South Dakota. Bulletins on fruit trees and ornamental trees and shrubs are ready for publication.

Terms: The money received from the sale of plants makes it possible to do the work on a larger scale than would otherwise be possible. Those who have followed the progress of the work for many years know the importance of ordering promptly, as soon as this list is received, as the supply of plants is limited. Terms are cash with order. No credit except to Government Experiment Stations.

PROGRESS WITH APPLES

More work in taming and improving the wild American crabapple is being done at Brookings than anywhere else in the world. I am happy to report progress after thirty-four years of experiments in this line, and that the way to still greater success is quite apparent. Prominent among the new apples bred from the wild American crab are the Anoka, the earliest and heaviest bearing of all apples; the Chinook crab, which keeps eighteen months; and the Redflesh crab, with red flowers, red fruit and red flesh. A lot more are on the way.

REDFLESH CRABAPPLE: GOOD FOR THE LAWN AND FOR THE ORCHARD

Introduced 1928. A most remarkable novelty, that is probably destined to world-wide popularity wherever apples are grown. The tree is ornamental as well as useful, the beautiful red flowers and moderate growth making it a very desirable lawn tree. The original tree gives promise of being a good annual bearer and bore its first two crops in 1927 and 1928. The fruit in size is $1\frac{1}{2} \times 1-5/8$ inches in diameter, in color a brilliant solid polished dark red all over. Under orchard conditions and especially when top-grafted, the fruit will probably attain larger size. The flesh is red throughout and makes excellent red preserves and red jelly which attracted favorable attention at the State College exhibit at the South Dakota State Fair, Huron, September, 1928. Season, fall.

Pedigree: *Pyrus Malus Niedzwetzkyana* x Elk River, Minnesota, wild crab. The seed parent is from the Tien Shan Mountains that separate Russian Turkestan and western China. One-year old buds on Siberian crabapple stock. Each, \$1.00.

WAKONDA CRABAPPLE

Offered for the first time. Another of my hybrids, native American apple with the standard apple. Pedigree: Nevis, Minnesota, wild crab x Northern Spy pollen. Fruit much larger than the original Nevis (*Pyrus Ioensis*) with considerable red color, indicates hybridity. These American wild crab hybrids are not to be considered as perfected varieties but as one step forward in the work developing a race of apples of culinary apple that will keep one year or more. The trees are early bearers, and as ornamental trees they are worthy of a place on any lawn. Under orchard conditions and especially when top-grafted, the fruit will probably attain larger size. Price of Wakonda crab, one year buds on Siberian crab stocks, each \$1.00.

OTHER WILD CRABAPPLE HYBRIDS

A few trees are available of the other wild crabapples described in South Dakota Bulletins 224 and 237, Wetonka, Chinook, Wakpala, and Wecota. One year buds in Siberian crab stocks, each \$1.00.

PROGRESS WITH PEARS

My opinion is that successful pear culture for home and market use is now possible for all South Dakota and the prairie Northwest, also for southern Manitoba and Saskatchewan. In 1924, I thought it would save fifty years of time by going to north Manchuria in the mountains along the railroad. I found the western limit of this northern type of *PYRUS USSURIENSIS* to be about fifty miles east of Harbin, where the temperature ranges to about 47 degrees below zero. The fruit of this winter pear is about $2\frac{1}{2}$ inches long and 2 inches across. The foliage is very ornamental in the fall, due to the bright red and yellow color. I see no reason why it would not be a good shade tree for the lawn. It may be worth trying a few as a roadside or street tree. The value of this type of pear is the strong resistance to the bacterial disease known as fire blight which kills the ordinary pear.

Price of Harbin pear seedlings: Size No. 1, Trees from 4 to 6 feet, each \$1.00; No. 2, Trees from 3 to 4 feet, each 75¢.

MING PEAR: A GOOD EARLY PEAR FOR THE NORTHWEST

Introduced 1917; names in 1927. I hope to have many more pear hybrids coming on in the future, but the Ming pear is worthy of trial right now. The original tree bore a heavy crop in 1926 and again in 1927. It has proven very resistant to fire blight.

Pedigree: *Pyrus Ovoides* x Louise Bonne de Jersey, a choice French pear. The fruit is of good commercial size, flesh melting, of delicious flavor, a first class pear. One-year trees, budded on Harbin pear seedlings, each \$1.00.

SANOMA HYBRID SANDCHERRY

Introduced 1929. Pedigree: Sapa x Dropmore, Manitoba sandcherry. The name is made up from the two words, Sapa and Manitoba. The Sapa is my hybrid of the South Dakota sandcherry with a Japanese plum and is famous for its black-red flesh and choice quality. At Brookings, the Sanoma is a good plant; productive; of upright habit; fruit thirteen-sixteenths inch in diameter; flesh red; good quality; pit round and small. If the Sanoma inherits the extreme hardiness of the Manitoba sandcherry, it will be hardier than the Sapa and hence very popular in Manitoba and Saskatchewan. One-year old buds on native plum stock. Each \$1.00.

TETON PLUM SEEDLINGS

These are all 1 year old seedlings of the Teton plum, a native plum found in Campbell County, South Dakota, and named and introduced by N. E. Hansen in 1912. The fruit is $\frac{3}{8}$ inch in diameter and is the largest native plum that I have found so far in South Dakota. These seedlings will be good to plant among the largest hybrid plums such as Waneta (Japanese X native) to furnish abundant pollen and ensure the bearing of fruit. Cross pollination is necessary for most plums. For the Sandcherry hybrids such as Opata and Sapa a few plants of the native Sandcherry will be useful as pollinators. Price of Teton plum seedlings, 1 year, 5 for \$1.00.

OKA CHERRY

This is not really a cherry, but a good substitute for a cherry. Introduced 1924. A Sandcherry hybrid, a seedling of Champa, rounder than Sapa and color or skin brighter, black-red flesh of good quality, plant of low bushy habit. The Oka is becoming popular over a wide area. A few plants, one year buds on Sandcherry roots, 2 for \$1.00.



SIBERIAN BLACK CURRANT

Collected in the Tomsk province, Siberia, in 1897 by N. E. Hansen. By selection this stock is increasing each plant generation in size of fruit. "Solbaer" is the name of this species in the Scandinavian countries where the fruit is much used. Listed in South Dakota Bulletin 224. Fruit of good size and plant perfectly hardy when several varieties of Black Currant from England and Germany winter-killed. The ordinary black currant is a native of western Europe where the fruit is highly prized for jelly and jams, but it does not do well in the prairie Northwest. This Siberian black currant will be hardy far north into Northern Manitoba and Saskatchewan, Canada. However, since the coming of the White Pine blister rust, which the European Black Currant harbors, this species is outlawed wherever White Pine and other five-leaved pines are grown. Plants for South Dakota planters, 2 for \$1.00.

PROGRESS WITH GOOSEBERRIES

By crossing the native gooseberry of eastern South Dakota with the giant gooseberries of England, the largest gooseberries in the world, eleven excellent varieties have been secured. These are described in Bulletin 224. They have proven very productive under cultivation. Lack of suitable land has prevented their more extensive propagation in recent years. A few plants are available of these varieties, my selection, each \$1.00.

NOTE: The work with raspberries, strawberries and other small fruits is being postponed for the same reason--no land.

THE HANSEN SELECT SANDCHERRIES

Developed through nine plant generations from 300,000 seedlings of the native sandcherry, *Prunus Besseyi*, a low shrub of western South Dakota. In late years seedlings from Manitoba have been added. The seedlings vary in size and quality of fruit, but all are good for sauce or preserves. The white flowers and glossy leaves make it desirable as a low shrub in front of taller shrubs on the lawn. See Bulletin 224. Strong seedlings, five for \$1.00.

SIBERIAN DEWBERRY

Introduced 1930. While sailing up the Irtysh River in Tomsk province, Siberia, in 1908, I noted with interest the many paddles of native dewberries brought to the steamer landings by the peasants. The fruit is roundish, small, black, with bluish bloom. Under cultivation on the open prairies here at Brookings the fruit, while of clear acid quality, has been too small to introduce as a market fruit. However, it may do better farther north. At any rate it is worthy of attention as the fruit can no doubt be increased in size by selection. The plant is hardy and productive. This is Seed and Plant Introduction No. 24377. From the steamer landing Kutschiskaya. A few plants can be spared, each \$1.00.

PROGRESS WITH GRAPES

The 32 varieties introduced by N. E. Hansen in 1925 were widely distributed and are now in propagation. No plants for spring 1930; some cuttings can be spared, my selection, 5 cuttings for \$1.00.

SIBERIAN LAVATERA

This is a hardy perennial growing 6 to 7 feet in height, brought by Prof. N. E. Hansen in 1913 from the dry steppes of Semipalatinsk Siberia. Flowers large pink somewhat like single hollyhocks. This is found hardy in Manitoba and Saskatchewan and blooms all summer. Plants, 2 for 50¢.

SIBERIAN HONEYSUCKLES

Young one-year seedlings of bush Honeysuckle with yellow or red berries, collected on the dry steppes at Semipalatinsk, Siberia, in 1913, by N. E. Hansen. 5 for \$1.00.



HANSEN WHITE PROSO

This grain millet I found among the Kirghiz Tartars, Semipalatinsk, Siberia, in 1913 and am selecting it for large kernels. A good feed grain for stock. Proso is a good table cereal, used by millions of people in Asia and east Europe and which has saved millions of lives in dry years when all other grain crops failed. In 1917 I imported a machine proso huller from Russia. However, the West is not ready for this grain as a table cereal, but is finding increasing use as good grain for all kinds of livestock. The names "Broom Corn Millet" and "Hog Millet" are not advisable. The name "Hog Millet", is not advisable as it is a good grain for all kinds of livestock. Farther south, the name "Hershey" is being used, but "Proso" is the official name. Ripens in 60 days, weight 60 pounds per bushel. Seed grown in 1927. Two pounds of seed by mail, 50¢.

A NEW HARDY ALFALFA WITH WHITE FLOWERS AND WHITE SEEDS

Considerable difficulty is experienced in the registration of alfalfa. At present hardy alfalfas are sold from registered fields and under affidavits, seals, and certificates of genuineness. But it would be highly desirable to have a hardy variety with a definite trade mark or easily distinguished character for the protection of the purchaser. Prof. N. E. Hansen of South Dakota State College has done this by crossing the yellow-flowered alfalfa he brought from Siberia with the alfalfa with variegated flowers which he brought from Russia in 1906, named and introduced as the Cossack. There are now many thousand acres of the Cossack alfalfa in cultivation. In the Hansen White Seed Alfalfa, both flowers and seeds are white. Since all the present commercial alfalfas have yellow seeds and either blue or variegated flowers, this white color is a definite character easily distinguished. The plant is vigorous and hardy at Brookings. It is the first alfalfa to be introduced with a definite trade mark. Dr. Hansen now wishes to test this new alfalfa elsewhere, especially in the alfalfa seed-producing uplands of western South Dakota, and offers to send ten plants free by mail to the first 300 applicants. The plants will be sent at planting time in spring. Planting directions will be sent with the plants. Ten cents in stamps should be sent to cover mailing expense. Send application before March 1st, to Prof. N. E. Hansen, State College, Brookings, South Dakota.

No plants of the Hansen White Seed Alfalfa will be offered for sale this year. A few plants of this variety were sent out in 1926. See South Dakota Bulletin 224.

MODIFYING GERM CELLS IN PLANTS

The President's address by N. E. Hansen to the South Dakota State Horticultural Society, at Mitchell, January 1931, described my European tour which began July 10 and ended October 16, 1930.

I presented a paper on Hardy Fruit Stocks at the International Horticultural Congress at London, August 7-15. The following week, August 16-23, was devoted to the Fifth International Botanical Congress at Cambridge, England. At the Horticultural Congress there were about 600 delegates and at the Botanical Congress, about 1200 delegates from some sixty countries of the world. The main object of the tour was to study the artificial modification of germ cells in plants, especially the latest cytological investigations in the modification of chromosomes in cultivated plants. The leading institutions for this kind of work were visited in England and Germany, also in the eastern United States and Canada on the return trip. France, Holland and Belgium were also visited.

The present light indicates that germ cells in plants can be modified in many ways, such as selection, methods of propagation, heat, cold, chemicals, radium, and X-rays. The work observed was of intense interest and it is to be hoped that South Dakota will furnish money for work in laboratory and field so that the solution of the chief problems may be hastened.

